



AN ISO 9001 : 2008 COMPANY & NABL ACCREDITED LABORATORY AS PER ISO/IEC 17025:2005
4, 7TH MAIN MALLESWARAM, BANGALORE -3

Certificate No.: TC-5548

TEST RESULTS OF GRADATION FOR GSB (IS 2386:(Part 1) 1963 (RA2011))

Lab ID : CP-2020-11-20-41 Date: 21-12-20
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05

Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division

Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64

Customer Reference : BBMP/EE/BTP/WO/132/2020-21

Date of Receipt : 18-12-20

Type of Mix : GSB (Granular Sub Base)

Date of test : 18-12-20

Oven Dry Weight : 10000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec. Limit Vide Table 400.1 MORTH Specification
75	0	0	0	100	100
53	997	997	9.97	90.03	80-100
26.5	1685	2682	26.82	73.18	55-90
9.5	1292	3974	39.74	60.26	35-65
4.75	1490	5464	54.64	45.36	25-55
2.36	1764	7228	72.28	27.72	20-40
0.425	1666	8894	88.94	11.06	10-25
0.075	1106	10000	100.00	0.00	0-5

TESTS ON FILLER SCREEN MATERIALS

Sl no	Particulars	Test results	Spec.Limit Vide Table
1	Liquid Limit, %	21.33%	Maximum 25
2	Plasticity index, %	Non plastic	Maximum 6

* The results obtained are satisfactory as per standard requirements.

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Date *[Date]*
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4, 7TH MAIN MALLESWARAM, BANGALORE -3

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TEST RESULTS OF GRADATION FOR WMM

Lab ID : CP-RW-2020-11-20-41 Date: 26-12-20
 Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05
 Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division
 Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64
 Customer Reference : BBMP/EE/BTP/WO/132/2020-21
 Date of Receipt : 23-12-20
 Type of Mix : WMM (Wet Mix Macadam)
 Date of test : 23-12-20
 Oven Dry Weight : 11000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I,Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	315	315	2.9	97.1	95-100
22.4	2259	2574	23.4	76.6	60-80
11.2	2179	4753	43.2	56.8	40-60
4.75	2251	7004	63.7	36.3	25-40
2.36	1621	8625	78.4	21.6	15-30
0.6	623	9248	84.1	15.9	8-22
0.075	1338	10586	96.2	3.8	0-5

* The results obtained are satisfactory as per standard requirements.

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Certificate No.: TC-5548

TEST REPORT OF AGGREGATE IMPACT VALUE

IS: 2386 Part IV

Lab ID : CP-RW-2020-11-20-41 Date: 26-12-20
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05
Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division
Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64
Customer Reference : BBMP/EE/BTP/WO/132/2020-21
Date of Receipt : 23-12-20
Type of Mix : Coarse Aggregate for WMM (Wet Mix Macadam)
Date of test : 23-12-20

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	300.2	300.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	73.9	74.0
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	225.9	225.8
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.4	0.4
5	Aggregate impact value	(B/A)*100	24.6	24.7
6	Aggregate impact value (Mean of two tests)	Percentage	24.6	

* The results obtained are satisfactory as per standard requirements.

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE (IS 2386 (Part 1) 1963 (RA 2007)

Lab ID : CP-RW-2020-11-20-41 Date: 26-12-20
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05
Agency : Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division
Customer Reference : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64
Date of Receipt : BBMP/EE/BTP/WO/132/2020-21
Type of Mix : 23-12-20
Date of test : Coarse Aggregate for WMM (Wet Mix Macadam)

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.8%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.5%	
Combined Flakiness and Elongation Index for WMM	25.3%	

* The results obtained are satisfactory as per standard requirements.

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TEST REPORT ON BITUMEN

Lab ID : CP-RW-2020-11-20-41 Date: 30-12-20
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05

Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division

Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64

Customer's Reference : BBMP/EE/BTP/WO/132/2020-21

Date of Receipt : 28-12-20

Sample Type : Bitumen

Reference to BIS codes : IS: 1201-1220(1978) (Reaffirmed-2004)

Date of test : 28-12-20

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C, in 1/10th mm	64	60 to 70
2	Softening Point, °C	51.2	Min. 40°C
3	Ductility, cm	98	Min. 75cm
4	Flash point, °C	245	Min. 220°C
	Fire point, °C	272	

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TEST RESULTS OF GRADATION FOR DBM (IS 2386:(Part 1) 1963 (RA2011))

Lab ID : CP-RW-2020-11-20-41 Date: 02-01-21
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05
Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division
Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64
Customer Reference : BBMP/EE/BTP/WO/132/2020-21
Date of Receipt : 31-12-20
Type of Mix : DBM-Plant (Dense Bituminous Macadam)
Date of test : 31-12-20
Weight of Sample : 5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10 (grading -2)
37.5	0	0	0	100	100
26.5	250	250	5.00	95.00	90-100
19	350	600	12.00	88.00	71-95
13.2	450	1050	21.00	79.00	56-80
4.75	1750	2800	56.00	44.00	38-54
2.36	400	3200	64.00	36.00	28-42
0.3	1350	4550	91.00	9.00	7-21
0.075	250	4800	96.00	4.00	2-8
PAN	200	5000	0.00	0	0

* The results obtained are satisfactory as per standard requirements.

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR DENSE BITUMINOUS MACADAM

Lab ID : CP-RW-2020-11-20-41 Date: 03-01-21
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads,
Dwarakanagara and Surrounding Area in Ward No 05
Improvements to RCC Drain and Roads at Babanagara Main and Cross
Roads in Ward No.05, Byatarayanapura Sub Division
Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road,
Yelahanka, Bangalore-64
Customer Reference : BBMP/EE/BTP/WO/132/2020-21
Date of Receipt : 31-12-20
Type of Mix : DBM (Dense Bituminous Macadam)
Date of test : 31-12-20

Table 500-6 : Physical Requirements for Coarse Aggregate for Dense Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	14.0	Combined Flakiness & Elongation Index for DBM is Maximum 35%	IS:2386 Part I
	Elongation Index	12.0		
Strength	Aggregate Impact Value	21.0	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.58	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.38	Maximum 2%	IS:2386 Part III

* The results obtained are satisfactory as per standard requirements.

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TEST REPORT OF AGGREGATE STRIPPING VALUE OF ROAD AGGREGATE (IS:6241)

Lab ID : CP-RW-2020-11-20-41 Date: 03-01-21
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05
Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division
Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64
Customer Reference : BBMP/EE/BTP/WO/132/2020-21
Date of Receipt : 31-12-20
Type of Mix : DBM(Dense Bituminous Macadam)
Date of test : 31-12-20
Type of Binder : 60/70
% of Binder Used : 5.0%
Weight of Aggregate : 200.0 gm
Weight of Binder : 10.0 gm
Temperature of water bath : 40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

* The results obtained are satisfactory as per standard requirements.

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Certificate No.: TC-5548

**TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR DBM
(IS 2386:(Part 1) 1963 (RA2011))**

Lab ID : CP-RW-2020-11-20-41 Date: 09-01-21
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05

Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division

Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64
Customer Reference : BBMP/EE/BTP/WO/132/2020-21
Date of Receipt : 08-01-21
Type of Mix : DBM (Dense Bituminous Macadam), (6th Cross Road)
Date of test : 08-01-21

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	475	476
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.8	4.8
4	Average percentage	%	4.8	

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Certificate No.: TC-5548

Lab ID : CP-RW-2020-11-20-41

Date: 09-01-21

AFTER EXTRACTION(Trail-1)

Weight of Sample(gm) : 475

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0	100.0	100
26.5	14.4	14.4	3.03	97.0	90-100
19	24	38.4	8.08	91.9	71-95
13.2	120	158.4	33.35	66.7	56-80
4.75	96	254.4	53.56	46.4	38-54
2.36	80	334.4	70.40	29.6	28-42
0.3	62.4	396.8	83.54	16.5	7-21
0.075	52.8	449.6	94.65	5.3	2-8

AFTER EXTRACTION(Trail-2)

Weight of Sample(gm) : 476

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0	100.0	100
26.5	14.8	14.8	3.11	96.9	90-100
19	24	38.8	8.15	91.8	71-95
13.2	120	158.8	33.36	66.6	56-80
4.75	96	254.8	53.53	46.5	38-54
2.36	78	332.8	69.92	30.1	28-42
0.3	62.4	395.2	83.03	17.0	7-21
0.075	52.8	448	94.12	5.9	2-8

* The results obtained are satisfactory as per standard requirements.

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Certificate No.: TC-5548

TEST REPORT OF AGGREGATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID : CP-RW-2020-11-20-41 Date: 07-01-21
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05

Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division

Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64

Customer Reference : BBMP/EE/BTP/WO/132/2020-21

Date of Receipt : 04-01-21

Type of Mix : BC(Bitumenous Concrete)

Date of test : 04-01-21

Type of Binder : 60/70
% of Binder Used : 5.0%
Weight of Aggregate : 200.0 gm
Weight of Binder : 10.0 gm
Temperature of water bath : 40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.5	1.5	98.3	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

* The results obtained are satisfactory as per standard requirements.

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Date.....

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Lab ID : CP-RW-2020-11-20-41 Date: 07-01-21
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05
Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division
Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64
Customer Reference : BBMP/EE/BTP/WO/132/2020-21
Date of Receipt : 04-01-21
Type of Mix : BC (Bituminous Concrete)
Date of test : 04-01-21

Table 500-16 : Physical Requirements for Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partial Shape	Flakiness Index	12.4	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.8		
Strength	Aggregate Impact Value	22.1	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.68	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.21	Maximum 2%	IS:2386 Part III

* The results obtained are satisfactory as per standard requirements.

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TESTS RESULTS ON STABILITY OF MIX

Lab ID : CP-RW-2020-11-20-41 Date: 07-01-21
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding Area in Ward No 05
Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads in Ward No.05, Byatarayanapura Sub Division
Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road, Yelahanka, Bangalore-64
Customer Reference : BBMP/EE/BTP/WO/132/2020-21
Date of Receipt : 04-01-21
Type of Mix : BC (Bituminous Concrete)
Date of test : 04-01-21

The results of the tests conducted on the Bituminous Concrete mix sample are as follow				
Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.14	11.13	10KN(min)
2	Marshal flow at 60°C, mm	3.52	3.51	2-4
3	Percent air Voids	4.82	4.83	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.28	14.26	13-15
5	Percent Voids filled with Bitumen(VFB %)	71.87	71.63	65-75
6	Density, g/cc	2.25	2.26	-

* The results obtained are satisfactory as per standard requirements.

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FOR CIVIL Pro.

R KARTHIK RECHAN
Authorized Signatory
Quality Manager

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HIGHWAY & BUILDING MATERIALS TESTING LABORATORY | STRUCTURAL
GEO TECHNICAL | PROJECT MANAGEMENT | SURVEYING SERVICES |



AN ISO 9001 : 2008 COMPANY & NABL ACCREDITED LABORATORY AS PER ISO/IEC 17025:2005
4, 7TH MAIN MALLESWARAM, BANGALORE -3

Certificate No.: TC-5548

**TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)**

Lab ID : CP-RW-2020-11-20-41 Date: 11-01-21
Project Name : Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads,
Dwarakanagara and Surrounding Area in Ward No 05
Improvements to RCC Drain and Roads at Babanagara Main and Cross Roads
in Ward No.05, Byatarayanapura Sub Division
Agency : M/s Sathya Constructions, (Prop) R Satheesh, No:600, Down Bazaar Road,
Yelahanka, Bangalore-64
Customer Reference : BBMP/EE/BTP/WO/132/2020-21
Date of Receipt : 09-01-21
Type of Mix : BC (Bituminous Concrete), (6th Cross Road)
Date of test : 09-01-21

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	472	471
3	Bitumen percentage	$\frac{A-B}{A} \times 100$ A	5.60	5.80
4	Average percentage	%	5.7	



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Certificate No.: TC-5548

Lab ID : CP-RW-2020-11-20-41

Date: 11-01-21

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 472

IS Sieve Size (mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.7	62.3	53-71
2.36	88	266	56.4	43.6	42-58
1.18	29	295	62.5	37.5	34-48
0.6	11	306	64.8	35.2	26-38
0.3	46	352	74.6	25.4	18-28
0.15	45	397	84.1	15.9	12-20
0.075	55	452	95.8	4.2	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 471

IS Sieve Size (mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	14.0	86.0	70-88
4.75	112	178	37.8	62.2	53-71
2.36	88	266	56.5	43.5	42-58
1.18	29	295	62.6	37.4	34-48
0.6	11	306	65.0	35.0	26-38
0.3	46	352	74.7	25.3	18-28
0.15	45	397	84.3	15.7	12-20
0.075	55	452	96.0	4.0	4-10

* The results obtained are satisfactory as per standard requirements.

Handwritten signature and stamp
 2020/11/20
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